NONREIMBURSABLE INTERAGENCY AGREEMENT (SAA3-1700)
BETWEEN
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GLENN RESEARCH CENTER
AND
AIR FORCE INSTITUTE OF TECHNOLOGY
FOR
SATELLITE HOSTING ATMOSPHERIC AND LITTORAL OCEAN WATER SENSORS PROJECT

ARTICLE 1. AUTHORITY AND PARTIES

The National Aeronautics and Space Administration Glenn Research Center, located at 21000 Brookpark Road, Cleveland, OH 44135 (hereinafter referred to as "NASA" or "NASA GRC") enters into this Interagency Agreement (hereinafter referred to as "IAA" or "Agreement") in accordance with 51 U.S.C. § 20113(e). The Air Force Institute of Technology, located at 2950 Hobson Way, Wright-Patterson, OH 45433-7765 (hereinafter referred to as "AFIT" or "Partner"), enters into this IAA in accordance with 10 U.S.C. § 113, § 133, § 134b, and § 2514. NASA and AFIT may be individually referred to as a "Party" and collectively referred to as the "Parties."

ARTICLE 2. PURPOSE

This IAA shall be for the purpose of NASA GRC and AFIT jointly collaborating in support of the Satellite Hosting Atmospheric and Littoral Ocean Water Sensors ("SHALLOWS") project (funded by the Office of Naval Research ("ONR") through Broad Agency Announcement ("BAA"), Number: N00014-17-S-B016). The SHALLOWS project entails designing and building a CubeSat with an ocean water ecology mission to measure bathymetry, turbidity, and harmful algal blooms, among others. The SHALLOWS project employs a novel hyperspectral-imager-on-a-chip technology as the project's payload.

Under this IAA, the Parties will collaborate regarding the design, maturation, and testing of the SHALLOWS payload, referred to within the SHALLOWS project life-cycle plans as Phase A.2. The following AFIT research centers are involved in this IAA: (1) The Center for Technical Intelligence Studies and Research (CTISR) (which will contribute expertise towards optically characterizing and calibrating the hyperspectral imager, radiometry analysis, and data processing) and (2) the Center for Space Research and Assurance (CSRA) (which will contribute expertise in engineering model integration and testing).

ARTICLE 3. RESPONSIBILITIES

A. NASA will use reasonable efforts to:

1. Provide technical, schedule, and cost management guidance to AFIT for the analysis, design, development and test of the SHALLOWS imaging system.
2. Lead the imaging design and development activity.
3. Scope the test plans, procedures and hardware required for imaging system testing.

B. AFIT will use reasonable efforts to:

1. Build and modify an analytical model of the imaging system to support the SHALLOWS Radiometric Analysis Team in the design, maturation, and testing of the payload hardware.
2. Provide consultation and modelling for trade studies, such as for lens selection, and/or mission parameters, such as slew requirements.
3. Support imaging system performance estimates with analytical modelling and calculations of other metrics including: (i) measuring the effective index for each hyperspectral imager (HSI), and (ii) using the effective index measurements and the spectral response curves to calculate calibrated spectral response curves for a lens.
4. Setup an experiment to measure the effective index of the spectral camera. AFIT's setup includes AFIT procuring parts and supplies for the experiment.
5. Verify the calibration with laboratory measurements of known spectra.
6. Document the imaging system analysis, methodology and results regarding the testing under this IAA in a final report deliverable to NASA.
7. As appropriate, report imager results in papers, technical reports, or presentations in accordance with this IAA.

ARTICLE 4. SCHEDULE AND MILESTONES

The planned major milestones and estimated schedule for the activities defined in the "Responsibilities" Article are identified below. The current circumstances related to the COVID-19 pandemic may significantly impact the schedule and milestones of this Agreement and dates are therefore subject to a considerable degree of variability. The Parties may utilize a separate document labeled as "Appendix A: Schedule Coordination Matrix" ("Appendix") to coordinate possible changes to the Agreement schedule. The Appendix is utilized only for Agreement performance planning purposes and the terms and conditions of this Agreement control. Any change to schedule identified in the Appendix must be signed or approved by the applicable Management Points of Contact or Technical Points of Contact for the respective Parties, as appropriate. The dates included in the aforementioned Appendix are the best approximation at the time this Agreement was created and may be amended.

1. NASA GRC to provide the project plan to AFIT.	See Appendix A
2. NASA GRC to provide the systems engineering management plan to AFIT.	See Appendix A

3.	NASA GRC to provide the system requirements document to AFIT.	See Appendix A
4.	AFIT to conduct the radiometric analyses and share results with NASA GRC.	See Appendix A
5.	AFIT to provide a test plan to NASA GRC	See Appendix A
6.	AFIT to provide test procedures to NASA GRC.	See Appendix A
7.	AFIT to complete imaging system testing.	See Appendix A
8.	NASA GRC to verify payload requirements and performance.	See Appendix A

ARTICLE 5. FINANCIAL OBLIGATIONS

There will be no transfer of funds between the Parties under this Agreement and each Party will fund its own participation. All activities under or pursuant to this Agreement are subject to the availability of funds, and no provision of this Agreement shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act (31 U.S.C. § 1341).

ARTICLE 6. PRIORITY OF USE

Any schedule or milestone in this IAA is estimated based upon the Parties' current understanding of the projected availability of its respective goods, services, facilities, or equipment. In the event that either Party's projected availability changes, NASA or AFIT, respectively, shall be given reasonable notice of that change, so that the schedule and milestones may be adjusted accordingly. The Parties agree that NASA's and AFIT's use of its own goods, services, facilities, or equipment shall have priority over the use planned in this IAA.

ARTICLE 7. LIABILITY AND RISK OF LOSS

Each Party agrees to assume liability for its own risks arising from or related to activities conducted under this IAA.

ARTICLE 8. INTELLECTUAL PROPERTY RIGHTS - DATA RIGHTS

NASA and AFIT agree that the information and data exchanged in furtherance of the activities under this IAA will be exchanged without use and disclosure restrictions unless required by national security regulations (e.g., classified information) or as otherwise provided in this IAA or agreed to by NASA and AFIT for specifically identified information or data (e.g., information or data specifically marked with a restrictive notice).

ARTICLE 9. INTELLECTUAL PROPERTY RIGHTS - INVENTION AND PATENT RIGHTS

Unless otherwise agreed upon by NASA and AFIT, custody and administration of inventions made (conceived or first actually reduced to practice) under this IAA will remain with the respective inventing Party. In the event an invention is made jointly by employees of the Parties (including by employees of an Party's contractors or subcontractors for which the U.S. Government has ownership), the Parties will consult and agree as to future actions toward establishment of patent protection for the invention.

ARTICLE 10. RELEASE OF GENERAL INFORMATION TO THE PUBLIC AND MEDIA

NASA or AFIT may, consistent with Federal law and this Agreement, release general information regarding its own participation in this IAA as desired. Insofar as participation of the other Party in this IAA is included in a public release, NASA and AFIT will seek to consult with each other prior to any such release, consistent with the Parties' respective policies.

Pursuant to Section 841(d) of the NASA Transition Authorization Act of 2017, Public Law 115-10 (the "NTAA"), NASA is obligated to publicly disclose copies of all agreements conducted pursuant to NASA's 51 U.S.C. §20113(e) authority in a searchable format on the NASA website within 60 days after the agreement is signed by the Parties. The Parties acknowledge that, if this IAA is entered into pursuant to NASA's 51 U.S.C. §20113(e) authority, this IAA will be disclosed, without redaction, in accordance with the NTAA.

ARTICLE 11. TERM OF AGREEMENT

This IAA becomes effective upon the date of the last signature below ("Effective Date") and shall remain in effect until the completion of all obligations of both Parties hereto, or one (1) year from the Effective Date, whichever comes first.

ARTICLE 12. RIGHT TO TERMINATE

Either Party may unilaterally terminate this Agreement by providing thirty (30) calendar days written notice to the other Party.

ARTICLE 13. CONTINUING OBLIGATIONS

The rights and obligations of the Parties that, by their nature, would continue beyond the expiration or termination of this Agreement, e.g., "Liability and Risk of Loss" and "Intellectual Property Rights" and related clauses shall survive such expiration or termination of this Agreement.

ARTICLE 14. POINTS OF CONTACT

The following personnel are designated as the Points of Contact between the Parties in the performance of this Agreement.

Management Points of Contact

NASA
Tibor Kremic
Chief, Space Science Project Office
Mail Stop: 162:316
21000 Brookpark Road
Cleveland, OH 44135
Phone: 216.433.5003
tibor.kremic@nasa.gov

Air Force Institute of Technology
Andrew S. Keys
Associate Professor, Center for Space Research and Assurance
2950 Hobson Way
Wright-Patterson, Ohio 45433-7765
Phone: 937-255-3636 x4747
andrew.keys@afit.edu

Technical Points of Contact

NASA
Carol M. Tolbert
Project Manager
Mail Suite: 162:305-16
21000 Brookpark Road
Cleveland, OH 44135
Phone: 216.433.6167
carol.m.tolbert@nasa.gov

Air Force Institute of Technology
Anthony L. Franz
Research Assistant Professor of Physics
2950 Hobson Way
Wright-Patterson, Ohio 45433-7765
Phone: 719-242-7185
Anthony.Franz@afit.edu

ARTICLE 15. DISPUTE RESOLUTION

All disputes concerning questions of fact or law arising under this IAA shall be referred by the claimant in writing to the appropriate person identified in this IAA as the "Points of Contact." The persons identified as the "Points of Contact" for NASA and AFIT will consult and attempt to resolve all issues arising from the implementation of this IAA. If they are unable to come to agreement on any issue, the dispute will be referred to the signatories to this IAA, or their designees, for joint resolution after the Parties have separately documented in writing clear reasons for the dispute. As applicable, disputes will be resolved pursuant to The Department of the Treasury's Intragovernmental Transaction Guide (Treasury Financial Manual, Vol. 1, Chapter 2, Part 4700, Appendix 10 (hereinafter, the "Intragovernmental Transaction Guide")).

ARTICLE 16. MODIFICATIONS

Any modification to this IAA shall be executed, in writing, and signed by an authorized representative of NASA and the AFIT.

ARTICLE 17. APPLICABLE LAW

U.S. Federal law governs this IAA for all purposes, including, but not limited to, determining the validity of the IAA, the meaning of its provisions, and the rights, obligations and remedies of the Parties.

ARTICLE 18. LOAN OF GOVERNMENT PROPERTY

The Parties shall enter into a NASA Form 893, Loan of NASA Equipment, for NASA equipment loaned to Partner

ARTICLE 19. SIGNATORY AUTHORITY

Approved and authorized on behalf of each Party by:

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GLENN RESEARCH CENTER

BY: MARLA PEREZ-DAVIS Digitally signed by MARLA PEREZ-DAVIS Date: 2022.01.18 17:17:51 -05'00'
Marla E. Pérez-Davis, Ph.D.
Center Director

DATE:

AIR FORCE INSTITUE OF TECHNOLOGY

BY: JONES.WALTER.F.1229874353 Digitally signed by JONES.WALTER.F.1229874353 Date: 2021.10.25 15:57:53 -04'00'
Walter F. Jones, AD-28, DAF, Ph.D.
Director and Chancellor

DATE: 25-Oct-2021

APPENDIX A: SCHEDULING COORDINATION MATRIX

Associated Agreement (the "Agreement"):	NONREIMBURSABLE INTERAGENCY AGREEMENT BETWEEN THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION GLENN RESEARCH CENTER AND AIR FORCE INSTITUTE OF TECHNOLOGY FOR SATELLITE HOSTING ATMOSPHERIC AND LITTORAL OCEAN WATER SENSORS PROJECT

The following matrix is provided as a means for the Parties to coordinate scheduling changes associated with the applicable Agreement milestones. Any schedule changes identified in this Appendix must be approved by the Management Points of Contact or Technical Points of Contact for the respective Parties, as appropriate. This Appendix and the activities and dates contemplated herein are governed by the terms and conditions of the Agreement. In the event of a conflict or ambiguity between this Appendix and the Agreement, the terms of the Agreement shall control.

Reference to Agreement Milestone	Schedule	POC Initials & Date (for Changes to Schedule)
1. NASA GRC to provide the project plan to AFIT.	On or about November 2021	
2. NASA GRC to provide the systems engineering management plan to AFIT.	On or about November 2021	
3. NASA GRC to provide the system requirements document to AFIT.	On or about November 2021	
4. AFIT to conduct the radiometric analyses and share results with NASA GRC.	On or about December 2021	
5. AFIT to provide a test plan to NASA GRC.	On or about March 2022	
6. AFIT to provide test procedures to NASA GRC.	On or about April 2022	
7. AFIT to complete imaging system testing.	On or about May 2022	
8. NASA GRC to verify payload requirements and performance.	On or about May 2022	

The initial dates populated above are the best approximation at the time the Agreement was created. Any dates above that exceed the term of the Agreement are invalid as such dates automatically expire upon the expiration of the Agreement.

Instructions for Change to Appendix: Management Points of Contact or Technical Points of Contact for the respective Parties, as appropriate, are to strikethrough matrix items intended for change and insert new information. Thereafter, each item changed will be initialed and dated accordingly.